

--State of the Art:

A former application, EP-A-800 895 (corresponding to U.S. Patent No. 6,129,614), describes a sharpening or grinding device which can be used for grinding flat clothings. A further earlier application PCT/IB98/01471(WO/99/16579) improves the concept according to EP-A-800 895.--

Please insert the following new heading and paragraph after the second paragraph on page 4 of the specification (a marked up copy of originally filed page 4 is attached):

--Summary of the Invention

Objects and advantages of the invention will be set forth in part in the following description, or may be obvious from the description, or may be learned through practice of the invention.--

Please replace the second paragraph on page 6 of the specification with the following paragraph (a marked up copy of originally filed page 6 is attached):

--A particularly preferable embodiment of the invention provides the carrier as a rotatable roller. A high cutting speed during the grinding of the clothing elements is enabled at a respective speed of the roller. The constructional arrangement of such a sharpening and grinding element is relatively simple and cost-effective.--

Please replace the third full paragraph on page 7 of the specification with the following paragraph (a marked up copy of originally filed page 7 is attached):

The face grinding elements can be provided with a coarser graining than the flank grinding elements. This ensures a different grinding effect on the clothing elements as well as a different service life of the elements. A respective arrangement of the grinding elements with respect to their graining ensures that the service life of both types of grinding elements is approximately the same despite different stresses, so that also the advancement of the clothing to the grinding element causes the same advancement of the flank grinding elements and the face grinding elements.--

Please replace the fourth full paragraph on page 7 and continuing onto page 8 of the specification with the following paragraph (a marked up copy of originally filed pages 7 and 8 are attached):

--The device further comprises a means for removing particles abraded by the grinding, thus reliably preventing any soiling of the device. By removing particles abraded by grinding, a disturbance-free operation is ensured, as well as the reliable prevention of any soiling of the fiber material. Preferably, the means for removing the abraded particles is a pneumatic suction means which extends over the working width of the clothing and is arranged with respect to the grinding position in such a way that it can produce an air flow through or past the grinding position. A complete suction of the grinding position and the clothing or clothing carrier is thus produced, so that during the engagement of the clothing in the fiber material, substantially no abrasive dust will adhere and lead to any soiling or defects in the fiber material.--

Please replace the fourth full paragraph on page 8 and continuing onto page 9 of the specification with the following paragraph (a marked up copy of originally filed pages 8 and 9 are attached):

--A device for advancing a clothing with clothing elements may be provided on a clothing carrier towards a sharpening or grinding device such as a sharpening or grinding device of the kind mentioned above and a plurality of individual grinding elements is arranged in such a way that a means is provided which brings a force to bear between clothing and grinding device, so that the clothing and the grinding device are pressed against one another, and causes a predetermined immersion depth of the clothing elements into the grinding device. As a result, an even pressing of the clothing against the grinding device can be ensured. This leads to a balanced state between the clothing and the grinding device which, depending on the chosen force, causes the predetermined immersion depth of the clothing elements. A pressing of the clothing against the grinding elements is performed, thus enabling the purposeful grinding of the clothing elements. The present device in accordance with the invention enables a grinding of the clothing elements which is particularly precise relating to shape and dimension. As a result of the cooperation of the sharpening and grinding device, a particularly advantageous device for grinding and sharpening is created. The aforementioned sharpening and grinding device can be used both with or without the advancing device in accordance with the invention. By combining the two devices, however, a particularly advantageous arrangement of the invention is achieved.--

Please replace the first full paragraph on page 10 of the specification with the following paragraph (a marked up copy of originally filed pages 10 are attached):

--The force can be applied via springs or fluid cylinders on the clothing. They can be flat coil springs, leaf springs or rubber springs. Pneumatic or hydraulic cylinders can be used in particular as fluid cylinders. The force can also be produced by the weight of the device, optionally in combination with a counterweight.--

Please insert the following heading after the second paragraph on page 11 of the specification (a marked up copy of originally filed page 11 is attached):

--Brief Description of the Drawings

Fig. 1 shows a copy of fig. 1 of EP-1-787 841;--

Please insert the following heading and replace the second paragraph with the following after the first paragraph on page 13 of the specification (a marked up copy of page 13 is attached):

--Detailed Description

Fig. 1 schematically shows a known revolving flat card 1, e.g. the carding machine C50 of Maschinefabrik Rieter. The fiber material is supplied in the form of opened and cleaned flocks into the filling box 2, received by a licker-in or taker-in 3 as a lap feed, transferred to a swift or cylinder 4, and cleaned and opened by a set of revolving flats. Fibers from the nonwoven disposed on cylinder 4 are received by a doffer 7 and formed into a card sliver 9 in the delivery section 8. Said card sliver 9 is then deposited by a coiler 10 in a transport can 11. The carding machine is provided with a "main suction means" with which waste can be removed. Such a suction means is not shown specifically in fig. 1, but it is certainly known to the man skilled in the art. An example for such a suction means is known in EP-A-340 458. The set of revolving flats comprises revolving flat bars which are not shown individually in fig. 1, but are indicated in fig. 2 with reference numeral 13. Each rod 13 is provided with a clothing 14.--

Please replace the fourth full paragraph on page 13 and continuing onto page 14 of the specification with the following paragraph (a marked up copy of originally filed pages 13 and 14 are attached):

--Fig. 2 shows an embodiment according to EP-A-800 895, with the grinding position "coinciding" in this embodiment with the cleaning position. This embodiment comprises a "brush" with a sleeve 59 (fig. 2), grinding elements 42 and cleaning bristles 50 which are carried by the sleeve and extend in the radial direction away from sleeve 59. The sleeve 59 is preferably formed of two "half shells" which in the installed state fit snugly against a drive shaft 57. The brush is provided as a part of the flat cleaning apparatus 60. Fig. 2 also shows a flat bar 13 (including the clothing 14). The direction of movement of the flat bar 13 as well as the direction of rotation of the sleeve 59 are indicated by arrows.--

Please replace the fourth full paragraph on page 16 and continuing onto page 17 of the specification with the following paragraph (a marked up copy of originally filed pages 16 and 17 are attached):

--For certain applications it has proven to be undesirable to realize the brush as a "fully equipped" carrier. Grinding elements are available on the market which are too aggressive in their effect in the fully equipped design. An alternative arrangement is therefore shown in fig. 6 and consists of a zig-zag-shaped row of the groups of brushes along each half shell. The individual bristles are shown in fig. 5A. Each consists of a filament-like nylon substrate, penetrated with silicon carbide. Following the gradual attrition of the bristle, new grinding particles are uncovered. The number of the clothing tips which are ground simultaneously is obtained from the number of the "bristle lines" L. This can be chosen depending on the output of the drive.--

Please replace the sixth full paragraph on page 17 of the specification with the following paragraph (a marked up copy of originally filed page 17 is attached):

- the brush with the carrier 59 (preferably formed of half shells), grinding bristles 42 and a respective bearing or fixing (not shown) in housing 20;--

Please replace the eighth full paragraph on page 17 of the specification with the following paragraph (a marked up copy of originally filed page 17 is attached):

- an air suction conduit 23 which extends over the working width of the clothing 14 and can be connected at one end with the main suction device 25 of the carding machine by means of a coupling 24 (Fig. 9);--

Please replace the fifth full paragraph on page 23 and continuing onto page 24 of the specification with the following paragraph (a marked up copy of originally filed pages 23 and 24 are attached):

--The sharpening bristle length can be 15 to 20 mm in the first application. The granulation of the bristle can be between approx. 300 and 600, e.g. approx. 500. The flap (not shown), which separates the air suction conduit 23 from the main suction device, can be actuated by the actuating system for the flat advancement (the lifting apparatus 26).--

Please replace the third full paragraph on page 25 of the specification with the following paragraph (a marked up copy of originally filed page 25 is attached):

--A practical solution could therefore comprise two different grinding brushes, whereof one (according to EP-A-800 895) produces the lateral grinding and the other (according to the present invention) produces a sharp tip. The preferred solution comprises only a single "brush" however, which is equipped with two different types of brushes.--

Please replace the fourth paragraph on page 25 and continuing onto page 26 of the specification with the following paragraph (a marked up copy of originally filed pages 25 and 26 are attached):

--A first embodiment can therefore be derived directly from the variant according to fig. 2 by using two different half shells, each with its own type of bristle. Such an embodiment is shown in fig. 13A. Since the grinding brush does not need to fulfill any cleaning function, the bristles 50 (fig. 2) are missing which penetrate the base of the flat bar clothing. One half shell is provided with grinding bristles 42 which (as in the variant according to fig. 2) work the side surfaces of the end sections of the hooks. The other half shell is provided with additional grinding bristles 82 which (as in the variant according to fig. 12) work the face sides of the end section.--

Please replace the second, third and fourth full paragraphs on page 26 of the specification with the following paragraph (a marked up copy of page 26 is attached):

--The invention is not limited to the variants according to figs. 12 and 13. Further variants are shown schematically in the following figures, whereby in said variants each half shell comprises both grinding elements for ensuring the lateral grinding as well as elements for working the face sides of the hooks.

Fig. 14 shows rows of relatively long side grinding elements 42 and rows of relatively short elements 82 for working the face sides. The elements 42 and 82 are inserted alternately in each (not shown) half shell. The carrier roller is designated with the reference numeral 204.

In fig. 15 each row of bristles is equipped both with long side grinding elements 42 as well as short face side working elements 82. Several of these rows of bristles can be arranged on the carrier roller (not shown). In order to enable easier mounting, they are arranged on half shells 205 and 206 which are screwed on in regular intervals on the cylinder or roller (not shown).--

Please replace the first and second paragraphs on page 28 of the specification with the following paragraphs (a marked up copy of originally filed page 28 is attached):

--Fig. 19 shows an example of an arrangement of grinding elements 201 and 202 on a half shell 205. In contrast to the embodiments according to figs. 13A and 13B, a different equipment with grinding elements 201 and 202 is shown on a half shell 205. The half-shell 205 is divided into individual segments. Flank grinding elements 201 and face grinding elements 202 are arranged in adjacent segments. As a result, each clothing element 210 is brushed over both by flank grinding elements 201 as well as by face grinding elements 202 during each rotation. To compensate for the axial forces which act on the roller 204 (not shown), it is provided that the flank grinding elements 201 are arranged in opposite directions. The axial forces which could occur due to the inclined arrangement of the flank grinding elements 201, will thus cancel each other out.

The flank grinding elements 201 are arranged in a substantially lower number on the half shell 205 than the face grinding elements. As a result, a relatively strong resistive force is brought to bear against the clothing elements 210 by the face grinding elements 202, so that the immersion depth is determined substantially by the height of the face grinding elements 202.--

Please replace the fourth paragraph on page 32 and continuing onto page 33 of the specification with the following paragraph (a marked up copy of originally filed pages 32 and 33 are attached):

--Fig. 23 schematically shows a composition of a grinding device SV with (only) an end part of a flat D, with the middle portion of the grinding apparatus SV being cut out. The grinding apparatus SV comprises a roller 204, a drive motor 239 with half-shells (not indicated in particular) which are provided with long bristles 201 and short bristles 202 (cf. Fig. 18 to 22). The flat D comprises a flat bar 13 with a clothing 14. The rod 13 is connected at one end with a belt 236 by means of an end head 235. Connections suitable for this purpose are shown in GB-B-870 424, DE-Gbm-7345579 and EP-A-627507 for example. The other end of the flat bar 13 is connected in the same manner with a second belt, which is why only one end needs to be shown and explained. The end head 235 is also provided with a sliding section 237 which usually slides on a so-called return rail 238 while the flat of the grinding apparatus approaches or after the flat has left the grinding apparatus. After the actuation of the advancing apparatus according to fig. 21, the end head 235 of a flat bar in the grinding position is no longer in contact with the return rail assigned to the same. Instead, an outer part 233 (fig. 24) of the end head, slides assigned to said rod end on the slide block (or slide plate) 224.--

Please replace the second paragraph on page 36 of the specification with the following paragraph (a marked up copy of page 36 is attached):

--It is assumed at first that the carding machine runs up from the standstill. No grinding cycle will take place. The flat conveying means (not shown) drives the flats along their normal path without advancing them to the grinding apparatus SV. This state is shown in fig. 25 with the unbroken lines. The sensor S responds to every passing flat and produces a respective output signal, e.g. an impulse which is supplied to the card control unit KS. In the example according to fig. 25, the first impulse is produced by the flat D7 because it moves first past the sensor S. Since "flat D7" is not recognized as such, the control unit cannot (yet) determine the momentary "position" of the revolving flat unit. The flats D8 to D12 then also move past sensor S, with each flat initiating an impulse in the evaluating unit (in the card control unit KS) via the sensor. Since the flats D8 to D12 are also not marked, the impulses cannot be distinguished from one another, which has been illustrated in the "time diagram" of the box KS in fig. 25 by simple vertical lines.--